The Relocation of Peyton Slough: A Unique Solution to a Water Quality Quandary

Lead Agency – San Francisco Bay Water Board

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Responsible Party - Rhodia Inc.

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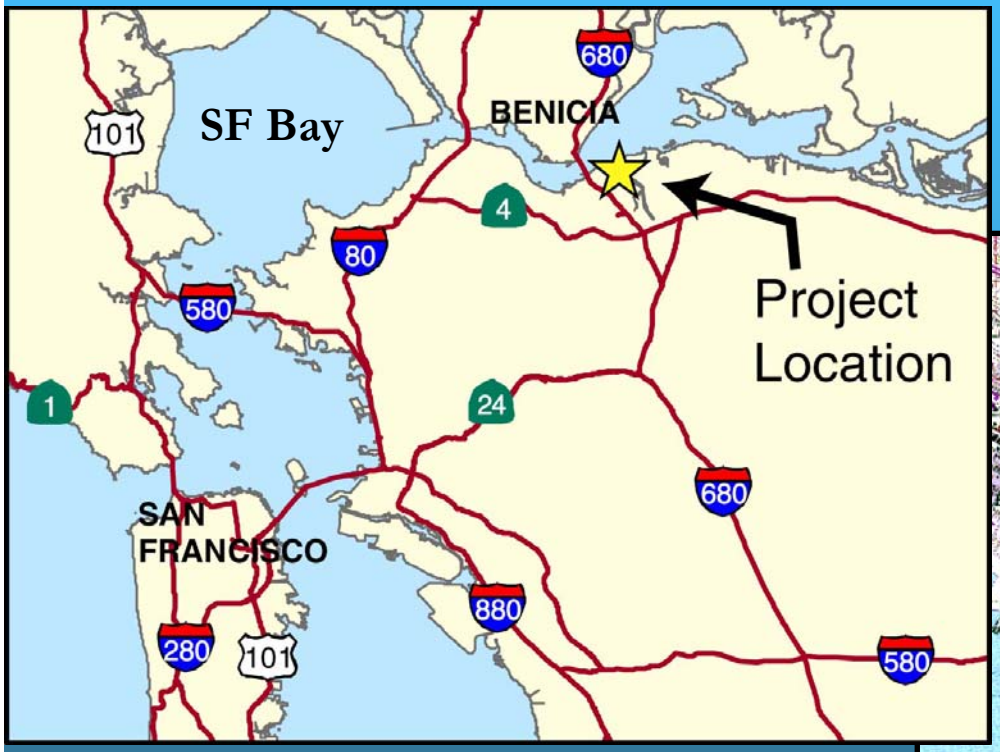
The Relocation of Peyton Slough

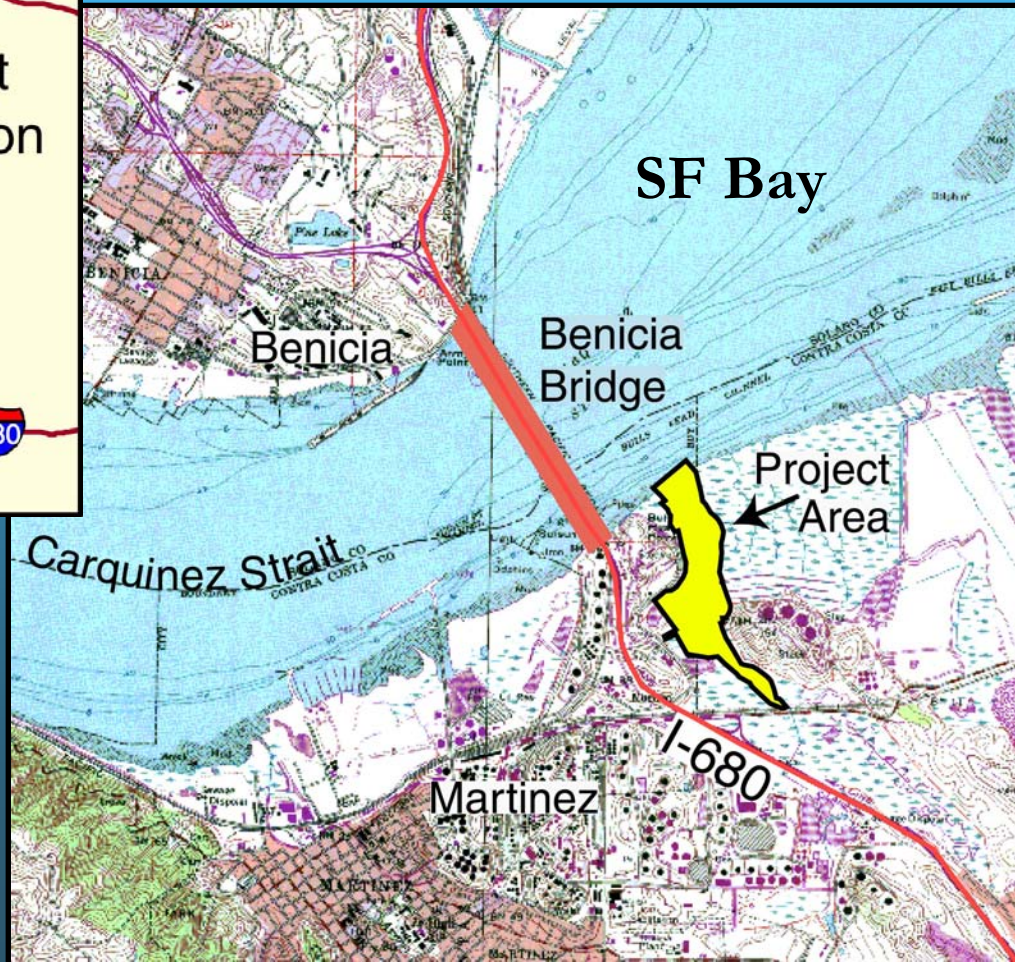
Project Summary

- In 1997, the SF Bay Water Board (WB) classified Peyton Slough as a Toxic Hot Spot due to sediments and adjacent wetland soils contaminated with copper and zinc, a result of ore processing operations at the site
- WB required the owner of the property (Rhodia Inc.) to cleanup the slough sediments and impacted wetlands (Site Cleanup Requirements Order 01-94)
- After extensive investigation and discussion amongst Rhodia, the WB, 8 other government agencies, and many public and private stakeholders; it was decided that the only viable long term solution was to relocate Peyton Slough out of contaminated sediments.

The Relocation of Peyton Slough

Project Location





The Relocation of Peyton Slough

Project Site in 2004 - Preconstruction

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Site History Mountain Copper Company operated a copper ore processing facility on site from 1899-1966. Tailing (waste rock) piles were so massive they subsided up to 40 ft below the ground surface into Bay Mud

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Scale of tailings piles

Massive tailings pile

Car next to building

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Site History Slough sediments contained extremely high copper (Cu) and zinc (Zn) concentrations from direct industrial discharge to the slough, as well as the discharge of groundwater contaminated by seeping through the subsided tailings. Surrounding wetlands were contaminated when contaminated sediments were dredged and placed in spoil piles along the slough for flood and mosquito-control.

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Remediation Strategy

Relocated the Slough east (dark blue) within the marsh and capped the old, contaminated alignment (light blue).

New Alignment

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Step by Step Summary of Remediation Approach

1. Excavated new alignment using an already existing drainage.

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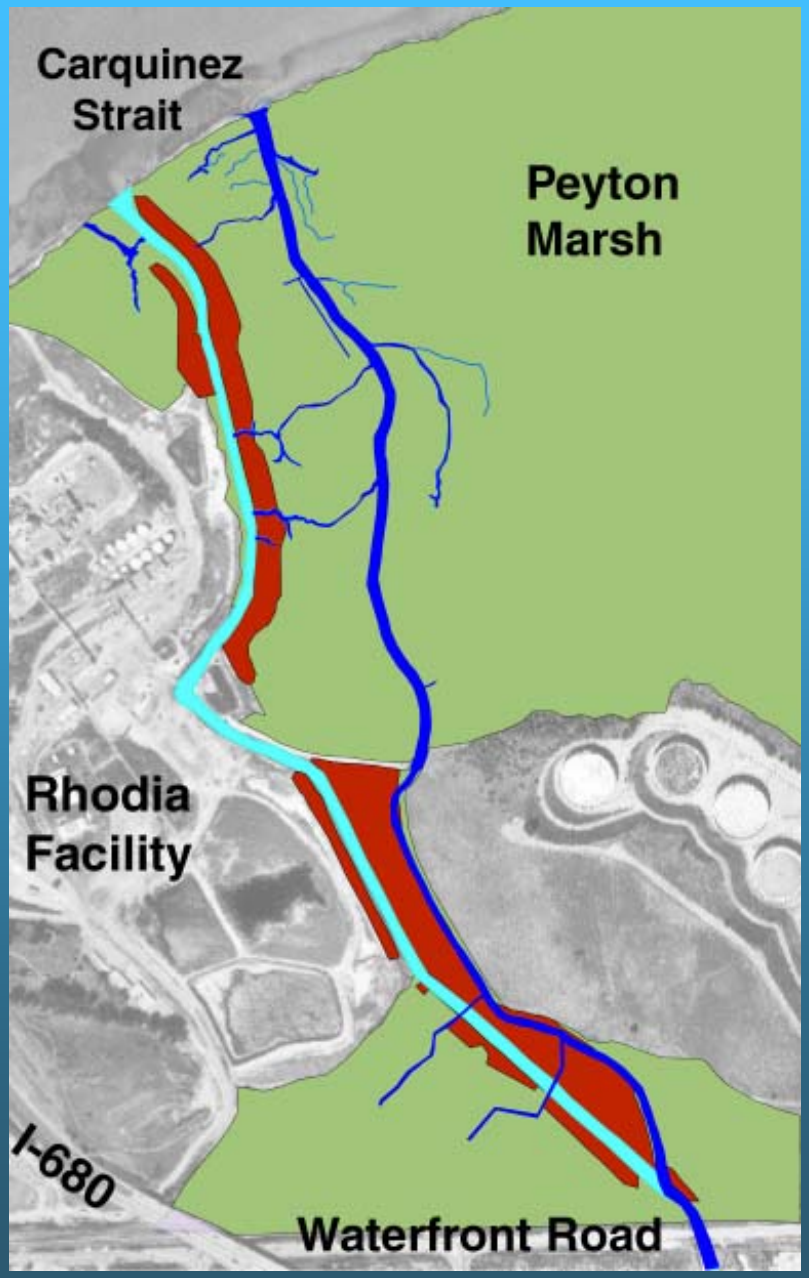

Step by Step Summary of Remediation Approach

1. Excavated new alignment using an already existing drainage.
2. Removed dredge spoil piles (red).

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Construction began May 2004

A road was built where the new slough alignment was excavated

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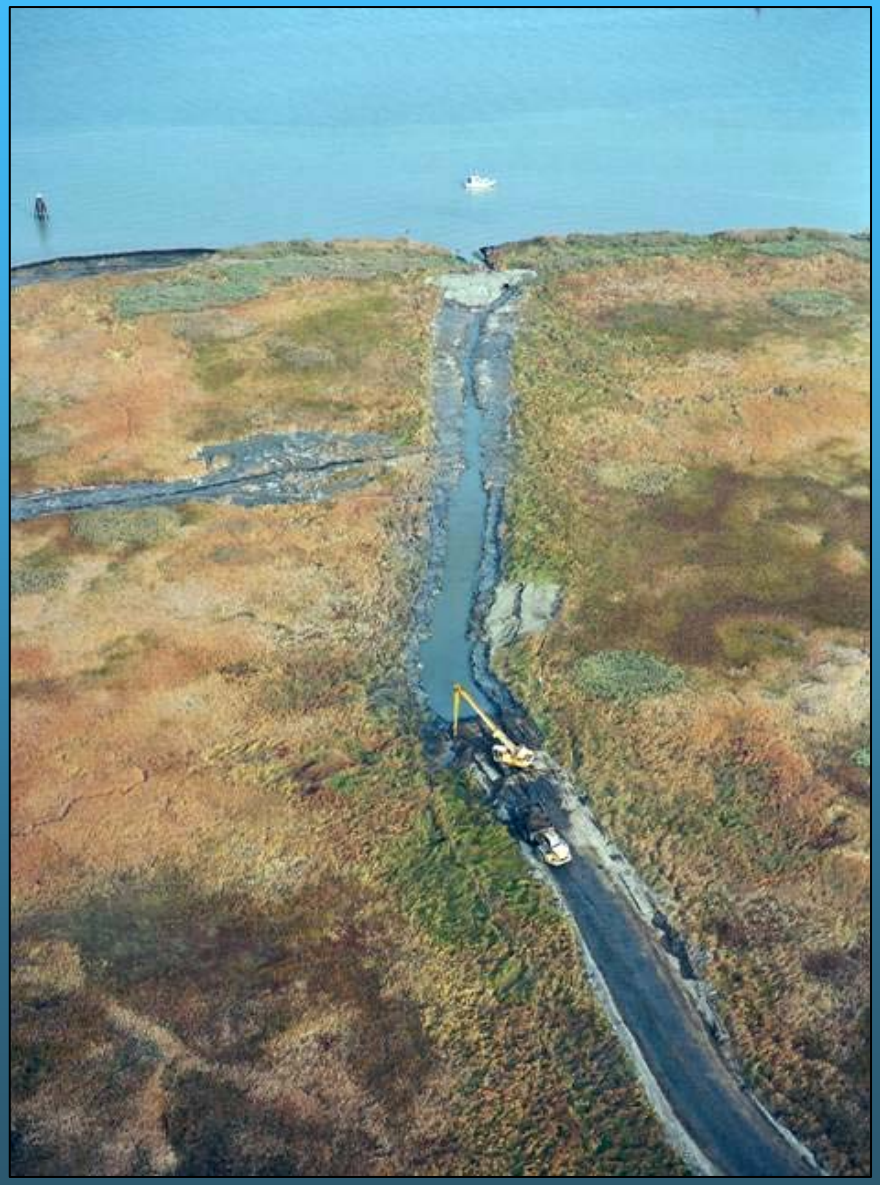
The new alignment was back excavated from the road



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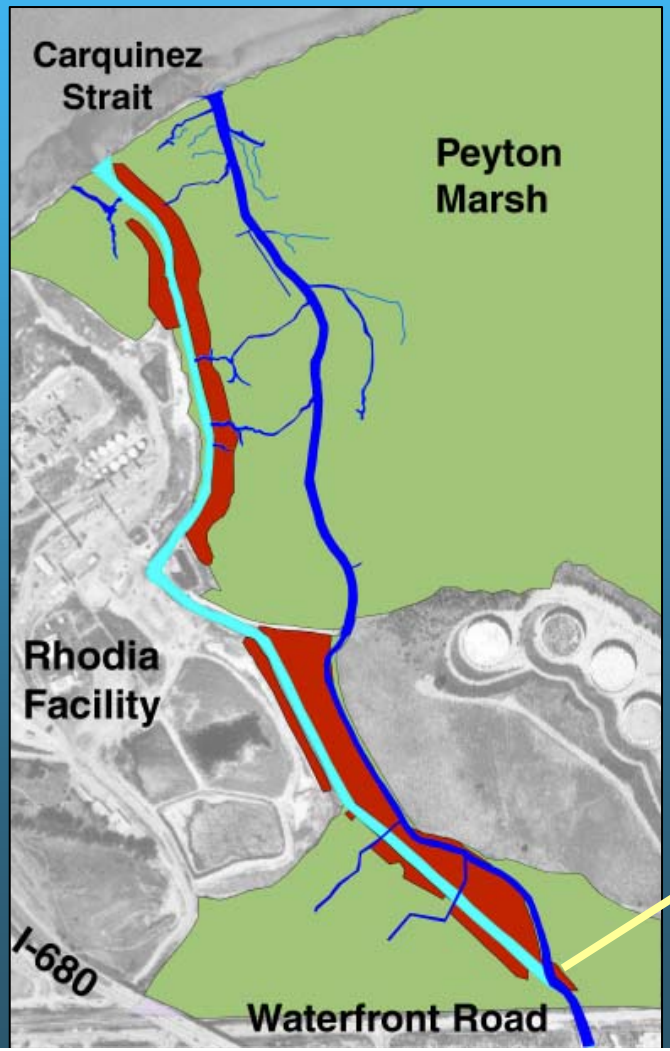
Construction

Transition point from old to new Slough



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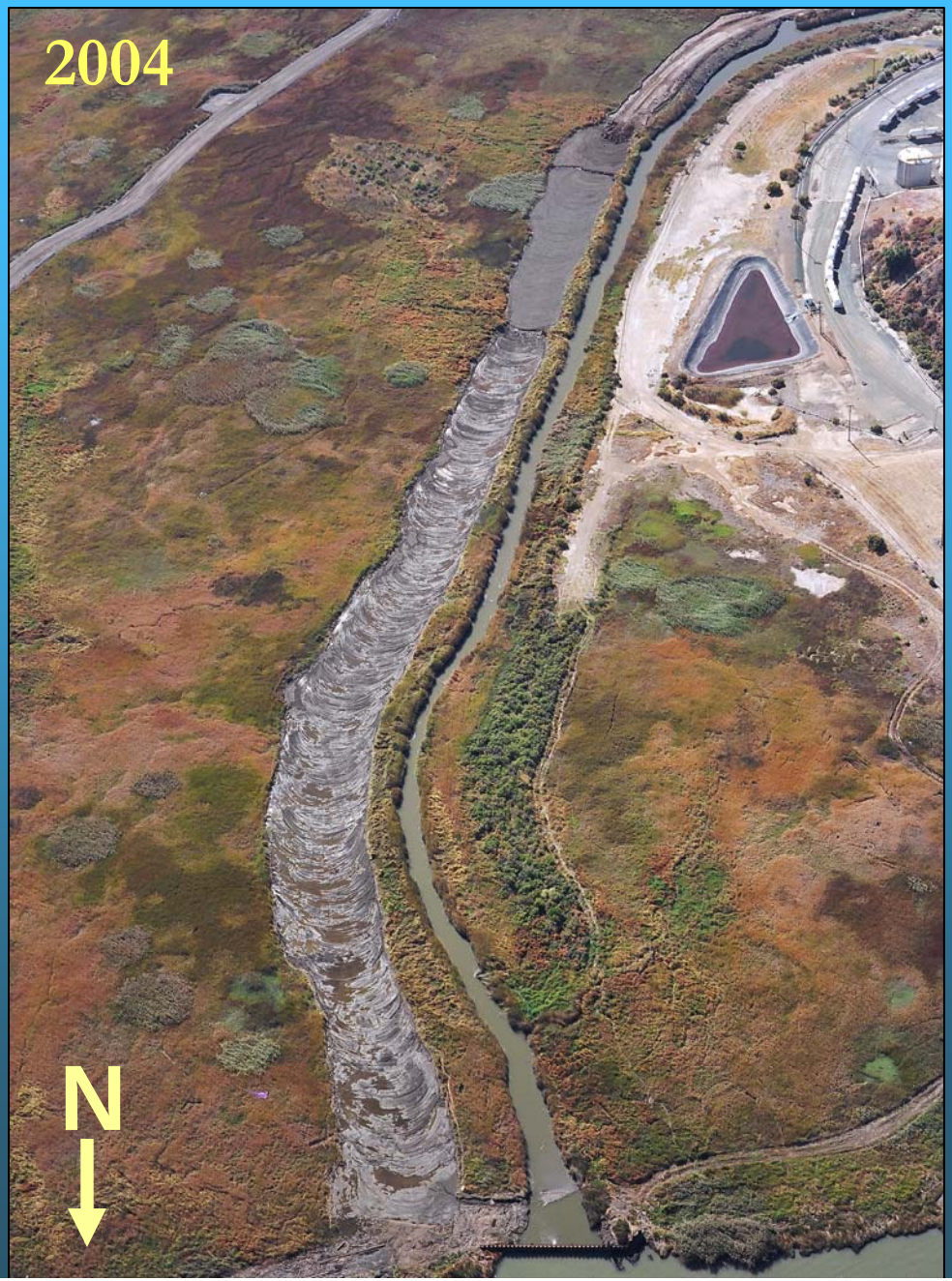
Construction

Excavated dredge spoil piles from the banks of old slough



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Construction

The Old Alignment was Capped August 2005

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Construction

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Project Benefits

Enhanced and created wetland habitat for special status species

Salt Marsh Harvest Mouse

California Black Rail

Sacramento Splittail

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Revegetation to encourage rare and/or beneficial species

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Project Benefits

One such beneficial species is pickleweed, which is vital habitat for the endangered Salt Marsh Harvest Mouse

Pickleweed in Peyton Marsh January 2005

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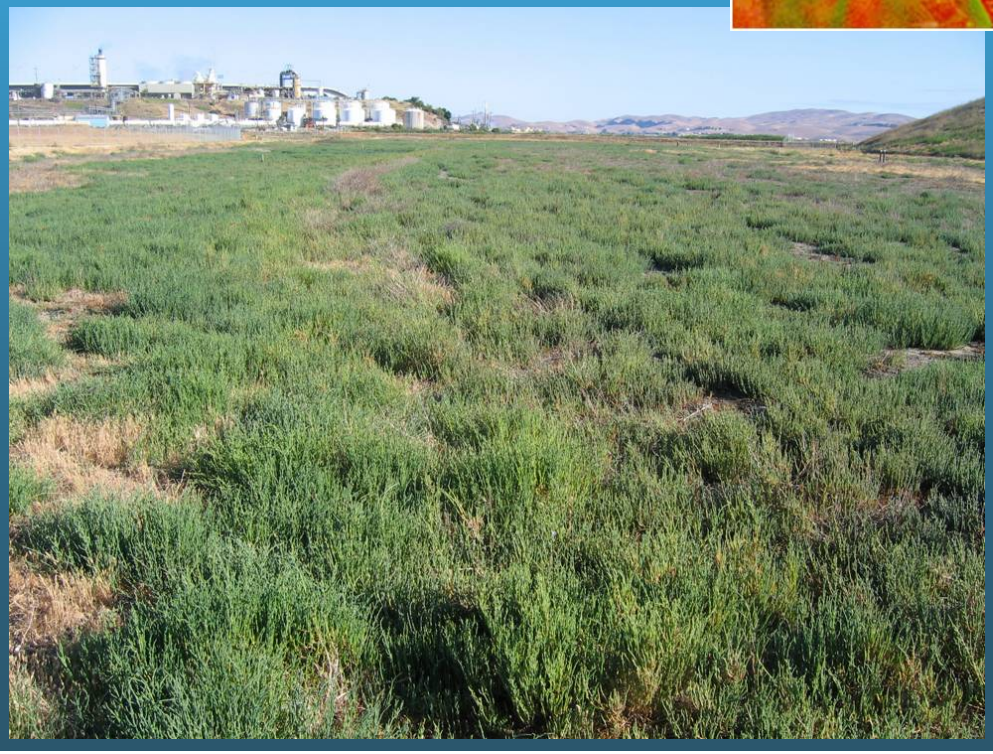

Pickleweed in Peyton Marsh June 2007

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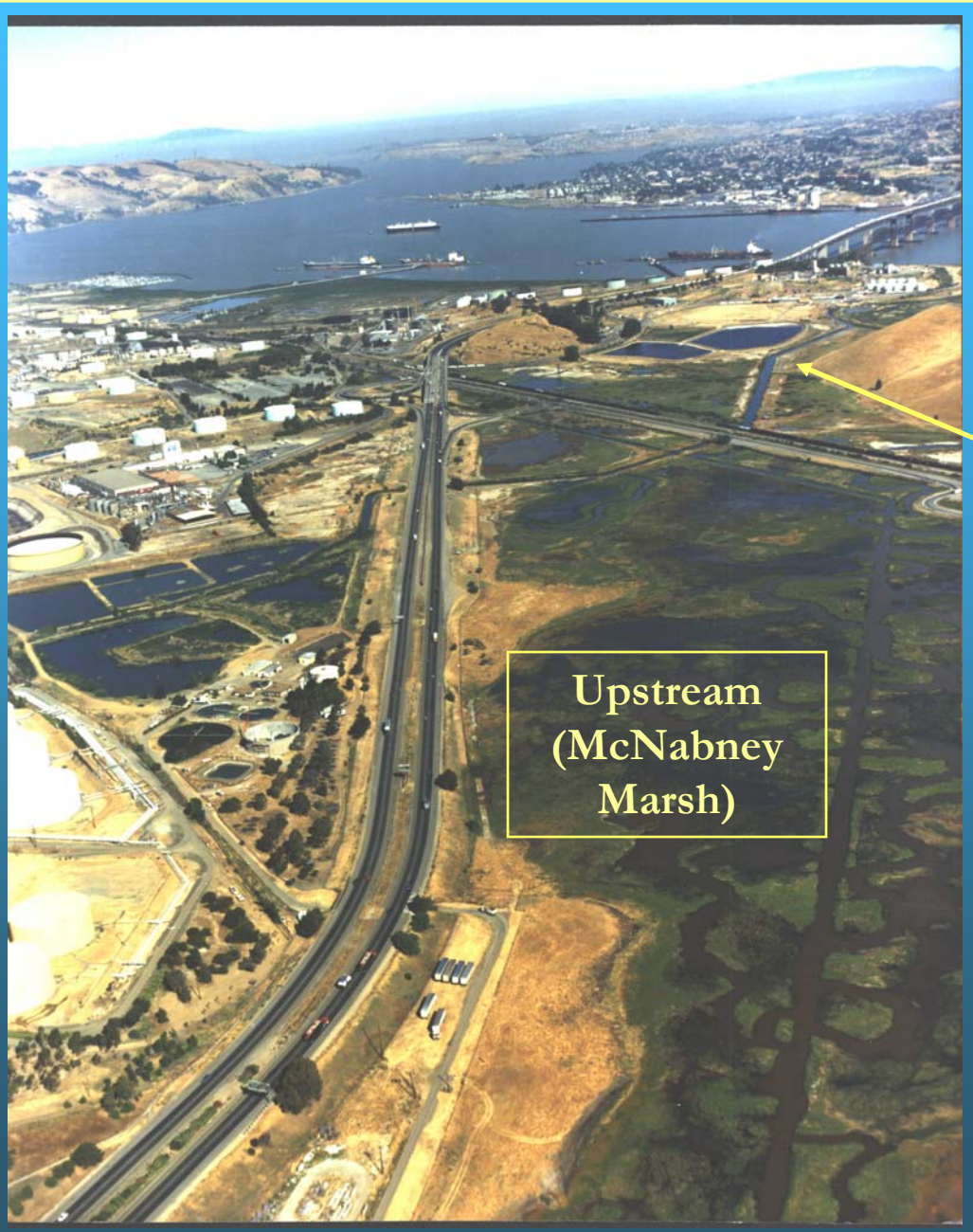
Project Benefits

The tide gate on the old alignment could only be operated to allow upstream marshes to drain into Peyton Slough. Tidal waters could not flow upstream of the tide gate because scouring of the slough bottom would create contamination upstream. This problem no longer exists with the new alignment tide gate.



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Project Benefits

Enhancement of flood control and mosquito abatement programs

Photo courtesy of Michigan State Government

Photo courtesy of Ohio State Government

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Project Benefits

Significant reduction of copper and zinc discharge to San Francisco Bay

Photo courtesy of USGS

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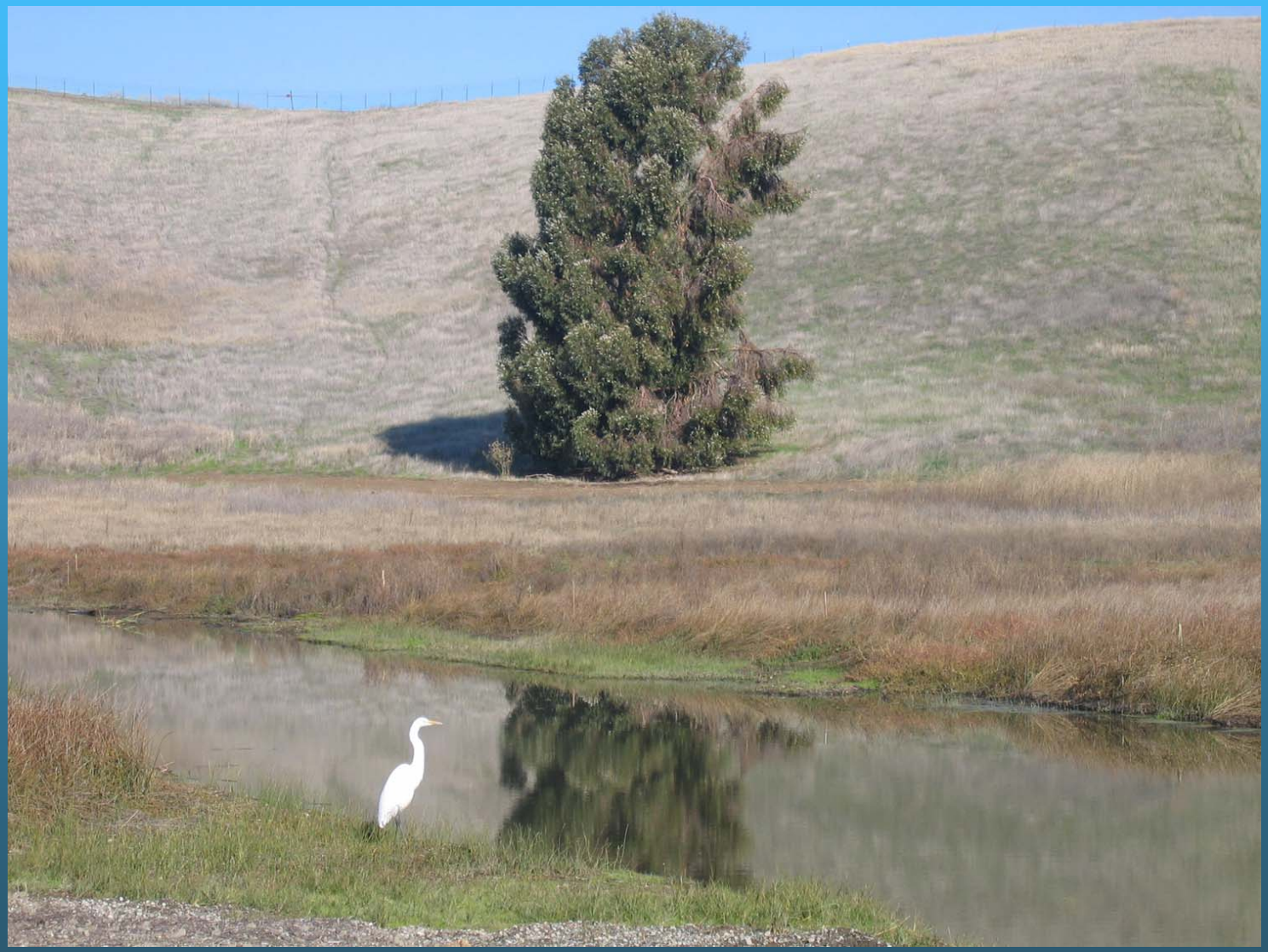

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Project Challenges Designed a temporary road over soft soils in marsh to minimize impacts to marsh habitat

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Project Challenges

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Project Challenges

Protected special status species during construction

Fish netted and relocated

Salt Marsh Harvest Mouse frightened off

Construction scheduled to avoid nesting, spawning, and breeding seasons

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Construction Completed November 2006

Now in Long-Term Monitoring Phase

WB Requirements

Monitor Copper, Zinc, & pH for 10 years

Groundwater

- 9 well pairs along new slough alignment
- 11 wells along old alignment

Sediments

- 5 stations within new alignment

Compared to background concentrations

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Long-Term Monitoring

Water Board Requirements

Surface Water

- 5 stations within new alignment

Compared to Water Quality Objective's

Benthic Ecology Surveys

- 4 locations in new alignment

Vegetation Surveys

- 9 transects

Compared to Old Alignment Baseline Surveys

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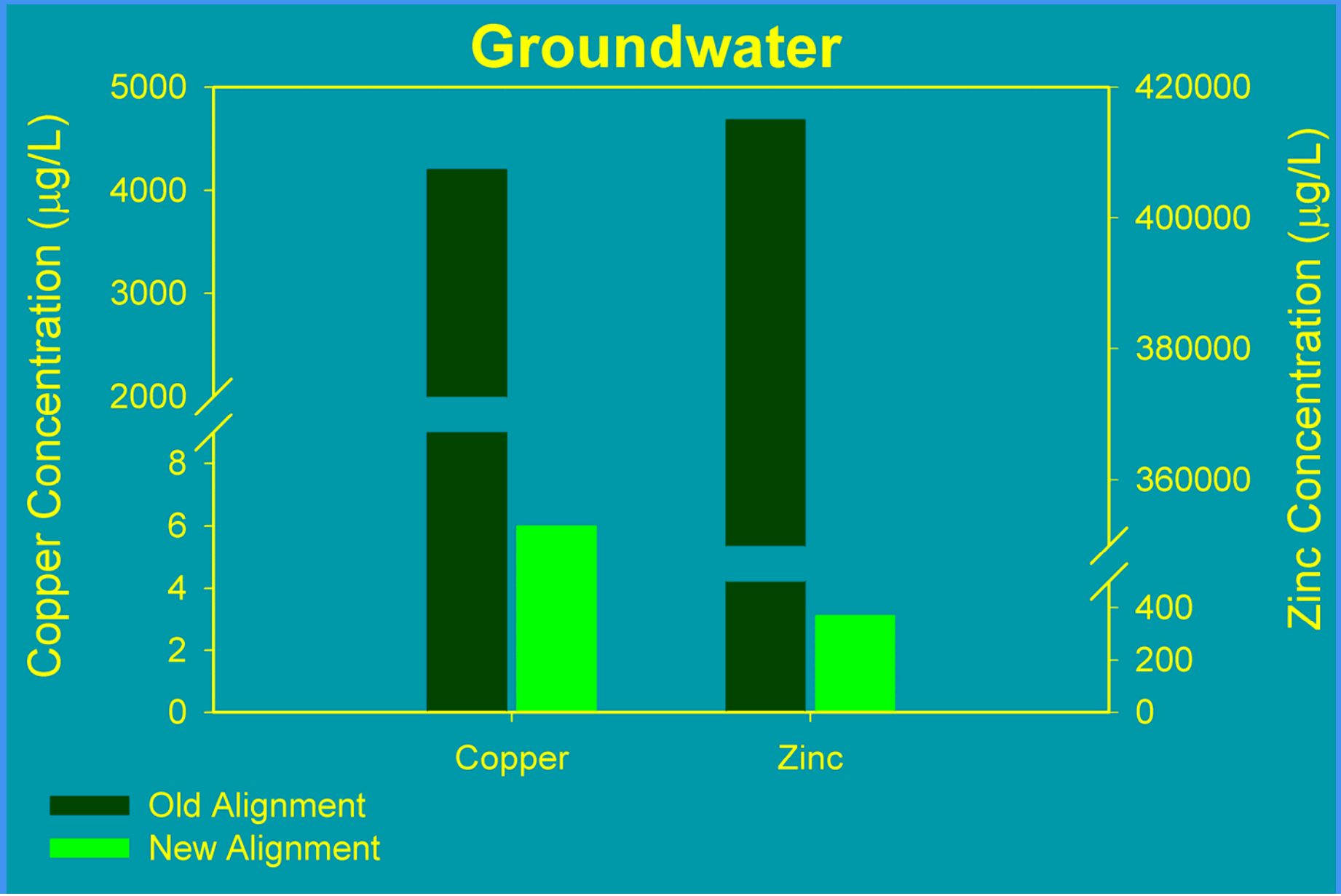
Results



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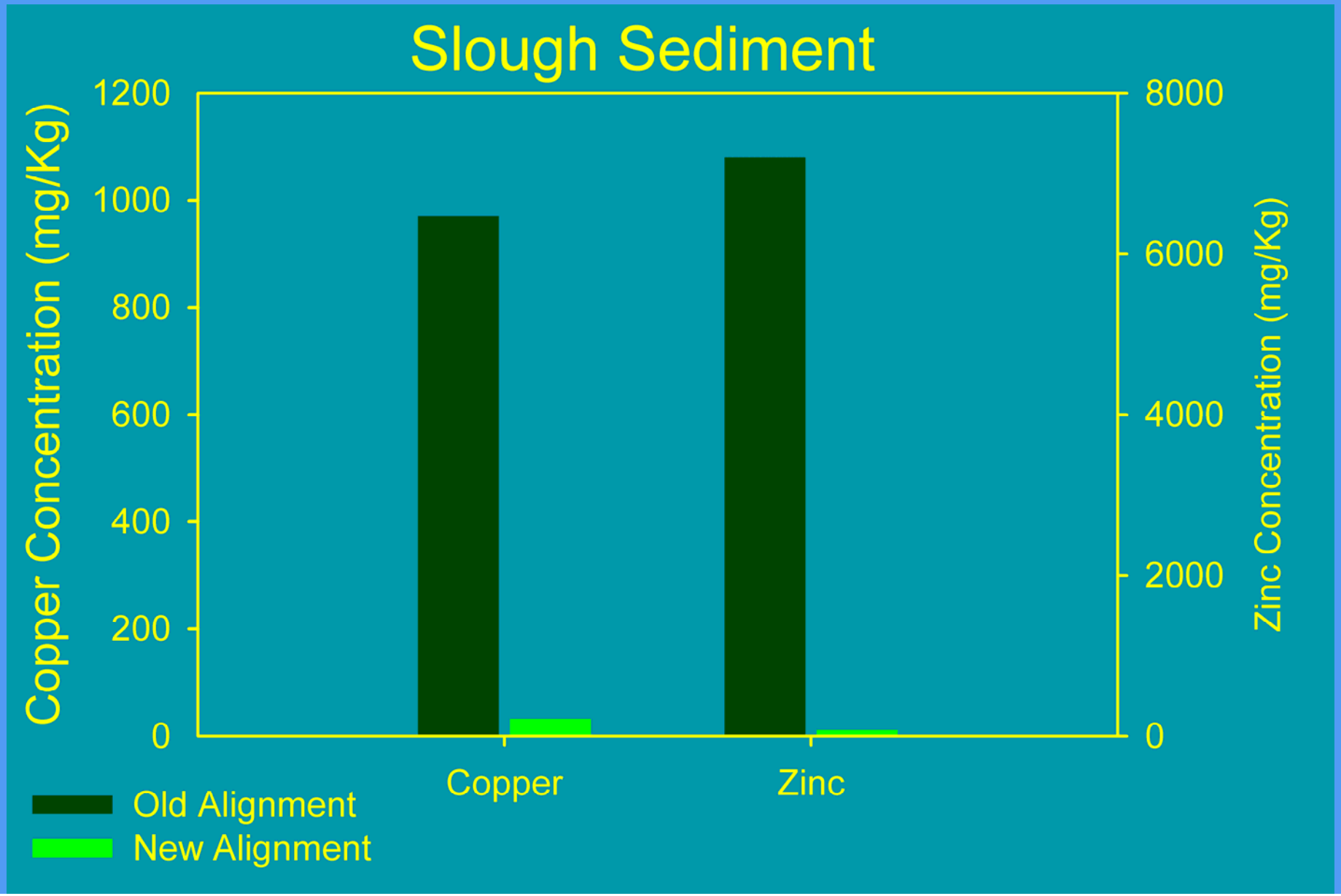

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Results

Restored Wetland

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Results

New Alignment

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Results

Former Dredge Spoil Pile March 2005

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Results

Former Dredge Spoil Pile August 2007

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Results

5.46 acres of new wetlands were created

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Results **100% revegetation is expected within ~3 years**

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Results

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Involved Parties

Discharger:
-Rhodia
Consultant:
-URS

Federal Agencies:
-US Army Corps of Engineers
-NOAA Fisheries
-US Fish and Wildlife Service

State Agencies:
-SFB Water Board (Lead)
-CA Dept of Fish and Game
-CA State Lands Commission

Local Agencies:
-BCDC
-City of Martinez
-Contra Costa County

Involved Parties:
-Contra Costa Mosquito and
-Vector Control District
-Mountain View Sanitary District
-East Bay Regional Park District
-Audubon
-Caltrans

Private Sector:
-Shore Terminals

Thank You

Water Board

Priya Ganguli, Terry Seward,

Curtis Scott, and Agnes Farres

Rhodia

Mary Brown

URS (Project Consultants)

Lois Autie,

Arnd Lilie, and

Francesca Demgen

Many photos provided courtesy of Rhodia Inc.